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ABSTRACT

Collected are reports of experimental instructional projects and educational programs generated by teachers at the Big Ten universities. The purpose is to exchange information among college teachers, administrators, and educational researchers about ways to improve the conditions for learning. The focus is on changes in a particular discipline area, but many arrangements can be easily adapted for use in other departments and interdisciplinary programs. Section one on subject matter describes department-based projects. Section two on institutional support includes descriptions of institutional facilities, instructional media arrangements, and broad programs that span different disciplines. Section three is the cumulative index to all twelve reports. (Author/KE)

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The Committee on Institutional Cooperation (CIC) was established in 1959 by the Big Ten Universities and the University of Chicago to facilitate pooling of resources and talents on matters of mutual concern in higher education.

Development and Experiment in College Teaching

No. 12
Spring 1976

Prepared and distributed
by the CIC Panel on Research
and Development of Instructional
Resources

Foreword

These annual reports are collections of experimental instructional projects and educational programs generated by teachers at the Big Ten universities. Our purpose is to exchange information among college teachers, administrators, and educational researchers about ways to improve the conditions for learning. Most of the reports focus on changes in a particular discipline area, but many of these arrangements can be easily adapted for use in other departments and interdisciplinary programs.

The entries in Section I, Subject-Matter Area, describe department-based projects. Section II, Institutional Support, includes descriptions of institutional facilities, instructional media arrangements, and broad programs which span different disciplines. Section III is the Cumulative Index to all twelve reports. This index has been updated by deleting references to projects that are no longer active (the Archival Index lists these inactive projects).

Examination copies of earlier reports are on file in the office of each institutional representative (see p. iv), and at the CIC central office. Requests to purchase back issues should be sent to the address below. This publication is not copyrighted and teachers and administrators are encouraged to make free use of the material.

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I. Subject-Matter Area

ART HISTORY

An Art/Architectural History Microfiche Program

Students in large lecture courses in the history of art, architecture, and art appreciation often have to study the visual arts from a limited number of black and white textbook illustrations, or from displays of 35mm slides. This restriction can be overcome to a great extent by using a microfiche reader with a large television-size screen, on which is projected a horizontal image from a microfiche containing seven rows of fourteen images made from a slide collection.

In a microfiche-based program at Illinois, works that are inherently sequential or programmatic were found to be most appropriate to the system's rows of images. Especially compatible were sequential views of a medieval cathedral and different viewpoints and details of its sculpture, sculptural programs, and Chinese ink paintings of the album and handscroll formats.

Slides taken from the original works (rather than duplicates or slides made from books) were chosen for their superior projection qualities. A guide to the images was prepared, including names, titles, dates, dimensions, and a description of media. Some experience in research and a practical knowledge of slides are necessary for this task. Preparation of slides, writing the guide, and making five microfiches occupied one person for two months in the summer, when slides were not in classroom use.

The best microfiche is composed of original slides of works that can be used even if there is a slight change of color, an increase of contrast, and/or a slight loss of detail. Works with flat, local colors and strong lines are safe to use. In general, slides that have very low color intensity or muddy hues, delicate linear details (as in a Dürer engraving or Celtic manuscript), and intricate chiaroscuro will suffer as they do when made into a duplicate slide.

For further information, contact Professor Norman Gambill, Department of Architecture, University of Illinois, Urbana, Illinois 61801.

CHEMISTRY

Algorithmization in an Elementary Chemistry Laboratory

A large undergraduate laboratory course in chemistry has been restructured with the assistance of the Instructional Development staff of the Audio-Visual Center and the Office of the Dean for Learning Resources at Indiana University. The course serves students majoring in fields other than chemistry, primarily nursing, education and liberal arts. Many students take a lecture course concurrently, although the courses are not interdependent.

Three major themes guided the design of the course: 1) the students were expected to "think like chemists" as they proceeded through the course experiences; 2) experiments were aimed at everyday problems (e.g., testing orange juice for Vitamin C, perform calculations estimating the strength of pain relievers, etc.), and 3) the course materials were designed to reduce student failure caused by inadequate preparation in mathematics and chemistry.

The three themes were most clearly exemplified in the design of the laboratory manual. An original document was prepared which included performance objectives, skill exercises in related mathematics and chemistry problems, algorithms which represented the logic of the experimental procedures and a series of experiments which utilized everyday chemical problems. The associate instructors (graduate students) were expected to support the students who had problems with the lab procedures, but were discouraged from providing the students with solutions.

Two written exams and a laboratory performance exam were designed to assess the logical processes the students used in solving the test items. Extensive reliability and validity data were collected in order to refine the items. A technical paper documenting this aspect of the project has been prepared for the American Educational Research Association, and will be delivered during the 1976 convention.

In addition, a more extensive technical report documenting the comprehensive evaluation of the course has been prepared by the Division of Development and Special Projects of the Audio-Visual Center. The evaluation focuses on the students' attitudes toward the course, associate instructor effectiveness, revision of the manual, correlates of success and a number of related issues.

Further information regarding the project may be secured from Dr. Martha O. Visscher, Department of Chemistry, A516, Indiana University, Bloomington, Indiana 47401.

Chemistry Test Generation and Administration by Computer

In the fall semester, 1974, a group of 150 students in Principles of Chemistry I participated in a self-paced program. The course was divided into five units, and the examinations for each unit consisted of 30 items selected randomly from a pool. The selection scheme for the items for a given test included a weighting factor based on item difficulty, discrimination and frequency of use. The examination for a unit could be repeated, but after the third effort the score obtained was decremented at a linearly increasing rate. In practice very few students exceeded three trials.

This self-paced program was extended to 500 students in Principles of Chemistry II in the spring semester, 1975. The procedure was similar to that employed in Principles of Chemistry I except the course was divided into six units. Examinations were 25 questions each and more examination periods were offered.

Two testing problems emerged in this self-pacing. The first was the finite number of questions available in the item pool. This raised some problems concerning adequate coverage of certain areas and the possibility for students to build up exam files and memorize difficult questions. The second disadvantage was difficulty in scheduling examination times so that all students would have an equal opportunity to take as many examinations as they might need.

Current plans are to use a computer-based system to overcome both of these difficulties. Such a system makes it possible to use a "dynamic" question generation procedure rather than a static question file. In addition, students could take a test any time a computer terminal was available.

For further information, contact Norman Baenziger, Department of Chemistry, University of Iowa, Iowa City, Iowa 52242.

Tutorial Assistance for Students in Introductory Chemistry Courses

The majority of students enrolled in introductory chemistry courses are not chemistry majors, but are students in other majors who must satisfy a one or two semester chemistry (or physical science) requirement. Many experience difficulty with chemistry content and testing procedures; the course proves a barrier to advancement in many scientific and technological majors. In an effort to improve the success rate in these courses, a tutorial program was begun in spring, 1974, to provide three general services: 1) direct tutorial instruction, 2) audio tape instruction, and 3) supplementary classroom instruction. Most students enrolled in the program participated in all three services.

Two half-time teaching assistants offered direct tutorial assistance for students in the program. Students were scheduled for tutoring sessions twice a week in groups of three students or less. The project staff routinely evaluated all schedules every three weeks for effectiveness; additional hours were scheduled as needed. At these tutorial sessions students were expected to take the initiative in asking questions and to seek additional practice on problems that caused them difficulty, but the tutors provided guidance.

In fall semester, the tutorial staff identified a number of topics of primary importance in Chemistry 108; behavioral objectives were written for some of these and several audio tapes were prepared and evaluated. Associated materials, such as files of test questions and some special study materials were developed to supplement the audio tape instruction. Twenty-two modules were prepared, which assume no prior knowledge of the subject matter and attempt to bring students to a level of proficiency appropriate to the course. Many modules not only teach basic chemistry concepts but are also intended to help students develop crucial math and study skills. A new feature of the program during spring semester was supplementary classroom instruction for students in the tutorial program.

In the three semesters that the project has been in operation, the success rate of disadvantaged students has improved from 22% to 82%.

For further information, contact Marion H. O'Leary, Program Director, or Elizabeth Kean, Project Associate, Department of Chemistry, University of Wisconsin, Madison, 1101 University Avenue, Madison, Wisconsin 63706.

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COMPUTER SCIENCE

Computer Programming and Numerical Methods

Eight videotapes, each 25 minutes long, have been produced on "Computer Programming and Numerical Methods"; they are suitable for undergraduates who have had one year of calculus and already know some FORTRAN. Each tape is a "case-study," dealing with the solution of a single problem and covering mathematical aspects (existence, uniqueness, ill-conditioning), the algorithm (numerical stability), the computer program, and the discussion of numerical results for test cases. Typical topics include solution of equations, data fitting, and the numerical solution of ordinary differential equations.

The tapes, produced in the Educational Media Lab, are suitable for supplementing existing undergraduate courses on numerical methods, or for short refresher courses for students or faculty on current methods of solving numerical problems by digital computer. They supplement existing videotapes on numerical analysis currently being used in C.S. 412, and are available on loan throughout the University of Wisconsin system. All UW campuses have facilities for playback, but if other institutions require 1" or 3/4" tapes, these can be supplied at cost.

A set of the tapes is kept in the Laboratory for Recorded Instruction, and can be viewed on request during the regular open hours or by special scheduling. The eight tapes can be purchased (in the form of 3/4" cartridges) for $276.00 total cost from the Instructional Media Center, Room 142 ESU (Unit 1). The tapes were used in Computer Science 412 during the first semester 1975-76. Sets of the tapes have been purchased and used by West Point Military Academy and Princeton University with encouraging results.

The tapes include:

REEL .01 Solving Quadratic Equations, Part 1: Numerical Analysis
REEL .02 Solving Quadratic Equations, Part 2: Program Design and Coding
REEL .03 Solving Quadratic Equations, Part 3: Coding and Testing
REEL .04 Function Evaluation and Noise-Level
REEL .05 Iterative Solution of Equations
REEL .06 Simultaneous Linear Algebraic Equations
REEL .07 Numerical Integration
REEL .08 Initial-value Problems for Ordinary Differential Equations

For additional information or to obtain tapes and supplementary materials contact Professor Ben Noble, Director, MRC, University of Wisconsin, 610 Walnut Street, Madison, Wisconsin 53706.

Images of Blacks in American Films: 1903-1950's

"Images of Blacks in American Film: A Historical Perspective," is a three-credit hour course offered by the Afro-American Studies Department. The course emphasizes analysis of films by or about blacks, considering where the images of blacks in those films originated, and how they were instrumental in shaping and modifying the attitudes of American whites toward blacks and the attitudes of blacks toward their own self-image. The course primarily surveys American films released in the period before The Birth of a Nation (1915) to the late 1950's; it was created through the cooperative efforts of Afro-American Studies and the Indiana University Audio-Visual Center.

The instructional format developed is an integrated classroom presentation of lectures, films, video tapes and slides. During each class period students hear a lecture designed to establish the historical context for the images of blacks which are developed through films, reinforced by repetition, and finally solidified into five major stereotypes: toms, coons, mulattoes, mammies and bucks (from the title of a text authored by Donald Bogle). Exceptions to these stereotypes are identified in films made by early black filmmakers and in some important (if rare) films produced, written or directed by sensitive whites. Important trends described through the lectures are exemplified and emphasized by showing students shorts and excerpts (when available) from the longer films under discussion. In addition to the class film showings, students are given an opportunity to see other major films of the period through the cooperation of the Black Culture Center.

During the research efforts it became immediately apparent that there was no comprehensive information bank concerning blacks and American films. To overcome this information shortage and to preserve their own research efforts, the developers of this course created a bibliographic filing system of over 1800 films. To increase possible access to this important research file all the citations have been recorded using a Wrubel Computing Center packaged computer program, SELIND. The file will be maintained and publicized as a means of sharing this information with other interested scholars and students.

For additional information, contact Phyllis R. Klotman, Afro-American Studies Department, Indiana University, Bloomington, Indiana 47401.

An Alternative to Traditionally Organized Study Abroad Programs

The Study Abroad Office at the University of Illinois, Urbana-Champaign provides an option for undergraduates who wish to study abroad, but for whom traditional program offerings are unsuitable. The individual approach to study abroad was devised to provide for the diverse interests of undergraduates who seek an academic, cultural and social experience in a foreign country. UIUC undergraduates may retain full student status and earn as much as 30 credit hours by registering for one of the university's individual foreign study courses.

Enrollment for the individual study abroad courses has grown from approximately thirty students three years ago to more than 130 students this year. Subjects range from anthropology to zoology and undergraduates study in as many as twenty different countries during a single calendar year. Because of varying linguistic ability and subject matter interests, geographic preference is uneven. Two students are presently attending universities in Japan; sixty-five are applying for direct admission to universities in Britain, where virtually any subject may be studied at one of the twenty-two cooperating universities.

Initial investigation, subsequent selection, interview and eventual application are steps in a process usually requiring a year's effort prior to the student's departure. Although the student has major responsibility, the UIUC Study Abroad Office provides information, suggests peer and faculty geographic or curricular expertise and directs and supports the final application procedure. Pre-departure activities concerning foreign housing and course selection may involve the student's advisor, college and various departmental representatives as well.

Upon return to the UIUC students generally consider themselves changed in terms of their assumptions and attitudes, having gained a better understanding of their native system by viewing it as outsiders. Tailoring foreign study options on the basis of personal preference and specific academic background is a viable approach that may well find greater utilization among other universities.

For further information, contact Dr. Harlan N. Henson, Director, Study Abroad Office, 367 Illini Tower, 409 E. Chalmers, University of Illinois, Urbana-Champaign, Illinois 61820.

ECONOMICS

Teacher Training Program in Economics

In 1970 the University of Minnesota Center for Economic Education initiated a teacher training program for graduate students in the Department of Economics. Prior to 1970 new graduate students who were assigned to either the micro or macro principles course as section teachers were simply given a text, a sample syllabus, a class list, and a classroom number. After five years of development, graduate student instructors (GSIs) at Minnesota are now required to participate in a teacher training program as a condition of employment.

In their first quarter of teaching, GSIs participate in nine weekly seminars dealing with teaching objectives, methods, and skills, as well as in a three-part teaching performance feedback process. The seminar sequence of the program starts one week prior to the beginning of the fall quarter; the sessions are designed to acquaint the GSIs with various patterns of teaching. A senior faculty member and an experienced graduate student take responsibility for the content and conduct of the seminars.

A series of feedback processes is designed to reinforce the teaching abilities and skills presented to the GSIs in the seminars. Each GSI is encouraged to assess his or her teaching performance on the basis of data collected from three feedback sources: a) an observation system involving three classroom videotapings followed by a standardized review and critique by a specially trained peer, b) student evaluations of the instructor via the Purdue Rating Scale for College Instructors, and c) test analysis aimed at evaluating content and application coverage.

Graduate students who are currently participating in the program may receive credit for their efforts under a graduate economics course number. The program is able to accommodate from six to fifteen new graduate students per year. On a per student basis, the costs are in line with other graduate courses at the University of Minnesota.

A complete operational description of this program (A Training System for Graduate Student Instructors in Economics by W. Becker, D. Lewis, C. Orvis, R. Riezman and M. Salemi) is available for $1.50 from the Center for Educational Development, 317 Walter Library, University of Minnesota, Minneapolis, Minnesota 55455.

EDUCATION

A Program for Alternative Careers in Education

The School of Education at Northwestern University has introduced a program for undergraduates which will help them prepare for educational roles in institutions other than schools. The New Careers Program is a course of study designed to help students understand human behavior--how people develop and how development can be enhanced--and apply their understanding in the many social institutions other than schools where teaching skills are needed.

The academic core of the program is an interdisciplinary concentration of courses in the behavioral and social sciences, including psychology, sociology, anthropology, management, and political science. In addition to course work, students receive credit for supervised practical experiences in off-campus institutional settings. A series of specially designed seminars helps students focus their course work and practical experience toward the goals of the program and their own career goals.

Graduates of the program will seek work in a variety of institutional settings; some plan further study in such fields as social work, law, psychology, and the social sciences.

Course work consists of the general education requirement for all students at Northwestern, an academic concentration in the social and behavioral disciplines, and practicum experiences in institutional settings in the Chicago metropolitan area. Special seminars for New Career students and faculty provide a common core curriculum which emphasizes methods of inquiry and analysis of social policy-making. The New Careers Program is one answer, in a School of Education with an interdisciplinary commitment, for the undergraduate who is interested in education, human development, and behavior, but who does not wish to enter the labor market with a teaching certificate and limit himself or herself to a career in public schools. During the first year of operation, 1975-76, the New Careers Program has exceeded expectations in attracting students.

For additional information about the New Careers Program at Northwestern University, contact Dean B. J. Chandler, School of Education, Northwestern University, Evanston, Illinois 60201.

An Experimental Course in Issues and Methods of Values Education

Wishing to promote the study of values on campus, the University of Michigan convened a "Values Year Committee" which has existed since September, 1974. The course described here is one of a number of projects funded by the committee. The course is taught at the graduate level in the Social Foundations Department of the School of Education.

The goals of the course are fourfold: 1) to examine specific value paradigms currently "on the market" that teachers use in classrooms; 2) to examine the social and psychological needs of classes in order to understand what fosters and hinders values exploration in the school setting; 3) to develop perspectives that facilitate critical analyses of values education paradigms; and 4) to promote a greater commitment on the part of the School of Education to dealing with values issues in teacher education.

The theoretical approach of the course states that "effective" values education always includes: a) an atmosphere that makes the student feel secure; b) values testing that creates cognitive dissonance within the student; c) a conscious set of values from which the teacher works; and d) teaching strategies which combine these objectives and make them known to the students.

The course has stressed experiences and guest lectures that deal with aspects of the theoretical approach. Various "on the market" values paradigms are critiqued in terms of the theoretical approach stated above. The students, most of whom are now teaching, are expected to consider how they will deal with issues of values education in their work as educators.

Evaluation of the course includes: 1) a critique group, composed of about 40% of the class, that meets every two weeks; the group critiques the course in terms of recommendations to be made in a report to the Values Year Committee and the School of Education; 2) weekly journals written by about 50% of the students; 3) short evaluation instruments used at the end of some of the sessions; and 4) the course evaluation administered by the School of Education at the end of the term. Additionally, if funding is acquired, a followup of the students in their jobs is contemplated; this would search for behavioral changes that the students feel were inspired to some degree by the course. A report to the School of Education and the Values Year Committee will be presented by the critique group sometime in June, 1976.

For more information contact Steve Manchester, 1113 Towsley Center, University of Michigan, or Mark Kinney, Institute of Gerontology, 520 E. Liberty, University of Michigan. To learn more about the Values Year Program contact Professor Terrence Tice, School of Education, University of Michigan, Ann Arbor, Michigan 48109.

A Self-Paced Instructional Approach for a Dynamic Systems and Controls Laboratory

The School of Mechanical Engineering at Purdue University is moving into modernized teaching laboratory facilities at the end of the 1975-1976 academic year. The laboratory sections of four required ME courses (Fluid Mechanics, Heat Transfer, Dynamic Systems and Measurements, and Dynamic Systems and Controls) will share one floor without any permanent separating walls. Each course serves approximately 200 students per year. A self-paced instructional approach has been developed for the senior level Dynamic Systems and Controls laboratory to promote efficient utilization of space while improving the quality of the student laboratory experience.

Important goals include allowing students to explore the properties of dynamic control systems at their own pace and emphasizing a realistic, creative laboratory situation. Under the self-paced format, the student is assured convenient access to available instrumentation or equipment on an open laboratory time basis (60 hours/week).

The laboratory experience is divided into 21 self-paced instructional (SPI) blocks, with eighteen required for minimum credit. A clearly stated hierarchy showing any block prerequisites facilitates student learning. After studying the instructional materials for a block, the student must demonstrate mastery of behavioral objectives. Assessment tasks may require oral or written responses; in either case students are allowed to defend their answers orally. If the student does not fully meet the block objectives, the laboratory instructor offers guidance; after additional study, the student may recycle until mastery is demonstrated with no stigma attached.

Thirteen orientation blocks cover necessary skills for equipment operation or introduce basic laboratory concepts. Five have audio-tutorial tape cassette materials to augment written instructional materials. The other eight blocks are hardware-oriented experiments; in three cases the student must submit in writing a proposed experiment procedure of his or her own selection and in three others a written laboratory report is required.

This self-paced instructional approach has been used in a twenty student pilot section with very encouraging results, based upon subjective views of the three laboratory instructors involved and on CAFETERIA questionnaire evaluations by students. Because of this preliminary success, all Dynamic Systems and Controls laboratory divisions are being combined into a single self-paced program in the Spring 1976 semester.

For additional information contact Professor E. Dawson Ward, School of Mechanical Engineering, ME Building, Purdue University, West Lafayette, Indiana 47907.

Technologically Oriented Instructional Games for Non-Engineering Majors

A service course, titled "Introduction to Environment Systems" was developed to present basic systems concepts in a non-mathematical manner to non-engineering majors. A major course objective is to provide students with opportunities to play decision-making roles in various technological processes. Computer-based instructional games with a technological orientation can give students a deeper appreciation of the internal structure of several technological processes and help them to perceive the nature of the interfaces between the processes and society.

Four games have been developed thus far: 1) DISPATCH, efficient electrical power generation and distribution under varying constraints and operating conditions; 2) WAQUAL, effective sewage treatment to maintain water quality in a river; 3) POPDYN, use of wasp population for establishing control of a beetle population to minimize food damage; and 4) FEEDLOT, weighing factors involved in a beef feedlot operation, including options of short term profit (or loss) and long term land value.

All of these games are computer based and may be played by individual students or groups. Competition between groups is not emphasized although in the postgame discussion, differences in output become apparent. The subsequent discussions lead students to new insights about the variables they did or did not control and hence to a deeper understanding of the interaction between environmental and technological systems.

An initial set of games was used in the 1974-75 academic year. It was anticipated that the use of these games would increase student motivation, focus student attention on major social and environmental issues and related decisions, and develop an experiential base for more advanced learning about decision making in a technological society.

Results have been very promising; student attitudes were extremely positive and learning outcomes exceeded expectations. Nevertheless, additional improvements will be implemented through a second Educational Development Program (EDP) grant, including a file management system to facilitate use in large classes and improved user's guides. Since the games are operating on the MSU CDC 6500 Computer, other MSU faculty members have access to the games for their courses.

For further information, contact Dr. Ronald C. Rosenberg or Dr. Fred T. Fink, College of Engineering, Michigan State University, East Lansing, Michigan 48824.

Continuing and In-service Training for Engineers

A growing interest in new forms of teaching (self-paced instruction, etc.) brought about a series of Effective Teaching Institutes sponsored by the American Society of Engineering Education. A one- or two-day ETI is held each year as a pre-conference activity of the ASEE Annual Conference. The success of these meetings provided an incentive for additional ETI's, held in conjunction with ASEE Section meetings. Attendance at these ETI's is limited to those living in the geographic boundaries of the section sponsoring the Institute.

Dean Harold Bolz of the OSU College of Engineering suggested to the ASEE Campus Activities Committee that an ETI for faculty of the College of Engineering would be an appropriate expenditure of funds from a gift provided by Robert A. Critchfield. Attendance at the first three Institutes has averaged 50 faculty members from various departments within the College of Engineering. The first two Institutes were directed by individuals with previous experience with ASEE ETI's outside the University. The 1975 Institute was a local production with leadership provided from the College of Engineering as well as the Department of Education.

The evaluation reports indicate that these Institutes were most successful in helping faculty to focus on some of the key elements of effective teaching and to leave the retreat with a new spirit of dedication to teaching. Almost all believe the experience and the time spent were most worthwhile. The general format has been to maintain a reasonable balance between time spent in formal Institute sessions and that allocated for fruitful faculty interchanges. Future presentations will be designed to deal with problem solving rather than product development as an educational goal.

Additional information concerning these activities is available from Prof. Richard D. Gilson, Department of Aviation, Box 3022, The Ohio State University, Columbus, Ohio 43210.

A New Co-Op Program in Engineering

A new four-year cooperative work-study program has recently been initiated at Ohio State. A unique co-op schedule can be completed in a total of four calendar years. After an initial three quarters in school, the student has one quarter of work experience. During the second and third years, two quarters on campus alternate with one quarter on the job. The final year includes three quarters of school, with graduation at the end of summer.

This new plan offers several advantages when compared to the traditional five-year plan. Students are attracted to the program because they can become productive graduates sooner. A given number of co-op jobs will support twice as many students. For each job, the employer has the opportunity to become acquainted with three students instead of two. Employers agree that they can adequately evaluate a student as a potential employee in four work quarters. The student learns a high percentage of the co-op lessons during the first three or four co-op experiences; little is lost by missing co-op jobs five through eight. The student's total earnings after five years, including nine months of post-degree career employment, are greater. In addition, all of the widely recognized advantages of cooperative education are retained by this program.

Additional information can be obtained from Prof. W. L. Starkey or Prof. D. D. Glower, Department of Mechanical Engineering, The Ohio State University, Columbus, Ohio 43210.

The Improvement of Writing Skills

The Center for the Teaching Professions at Northwestern University has introduced a program to help students examine and improve their writing skills. The Writing Place is a drop-in center for all Northwestern students who want help with their writing, and a resource center for all paper-writers. The center offers tutoring, reference materials, and a quiet, comfortable place to work. Academically successful Northwestern students, representing a variety of fields of study, are employed through the University work-study program as peer-tutors. Emphasis is placed on the process of composition: the stages through which successful writers take their work, from analyzing an assignment to proofreading final copy.

The peer-tutors are trained to help the writer focus on particular problems in one or more of the stages involved in successful writing. A collection of writing process models is available for use in tutoring. These consist of documents contributed by Northwestern students and faculty, representing this stage-by-stage development in various kinds of academic writing. For each model, notes, outlines, drafts, revisions, and final copy are sequenced in the order of composition and placed in large notebooks for reference use. These models are intended to indicate not only what a good finished piece of writing looks like, but also to present realistic images of how such writing is made.

The Director of The Writing Place is an advanced graduate student in English Education, assisted by a Professor of English and Education and a Professor of Linguistics who are Faculty Fellows of The Center for the Teaching Professions. Student use during the first two quarters of the academic year 1975-76 has exceeded expectations, and additional peer-tutors will be added to the staff for 1976-77.

For additional information about The Writing Place contact Dr. B. Claude Mathis, Director, The Center for the Teaching Professions, 2003 Sheridan Road, Northwestern University, Evanston, Illinois 60201.

An Individualized Writer's Workshop

During the past year, the Writer's Workshop at the University of Michigan Reading and Learning Skills Center has been actively involved in developing a self-paced, individualized program for improving writing skills. Presently, the Writer's Workshop offers a variety of options for students who seek writing help.

Any student may participate in six-week long, non-credit mini-workshops covering writing fundamentals. Interested students meet for one and a half hours per week in workshop sessions which focus on rhetorical skills. These are supplemented by criterion referenced self-instructional modules developed by the Writer's Workshop staff. It has become necessary to charge for this service; the cost to students or others associated with the University is $15.00 for the mini-workshop series.

The self-instructional lab at the Reading and Learning Skills Center offers a variety of programmed and non-programmed materials to help students in basic writing skills. Students take a diagnostic test and design their own instructional programs based on test results.

The Writer's Workshop offers individualized counseling sessions for students with unique or urgent writing problems. With the addition of the materials developed for the mini-workshops and self-instructional lab, these sessions have become more efficient. Not only can students get immediate help on individual papers, but they can also get more long-term individualized instruction with a minimum of actual one-to-one teaching hours required.

For further information, contact Rowena Wilhelm, Director, University of Michigan Reading and Learning Skills Center, University of Michigan, Ann Arbor, Michigan 48109.

English Placement Test at the University of Wisconsin

Several years ago the College Writing Association, composed of directors of introductory English courses in the University of Wisconsin system, began to discuss the increasing need for remedial work in composition on our campuses. The Association decided that one of its immediate tasks was the construction of a placement test whose content and standards would suit the particular needs of this University system and would be completely determined by practicing classroom teachers of composition. This test would have as its major purpose the identification of those students who need immediate remedial help, and at the other end of the scale, those students who could justifiably be placed into advanced courses.

A test construction committee was formed to create a 100-item test on the skills deemed necessary for good writing. The experimental form of this test had been given to about 3,000 students as of the beginning of summer 1975. Through continuing statistical analysis, the test has been refined so that it effectively distinguishes the students with the strongest or the weakest language skills from the general body of students.

The Test Development Committee settled on three broad categories of items: Usage, Sentence Correction, and Reading Comprehension. Usage items ask the student to identify deviations from standard written American English. Sentence Correction items require the students to select the most effective expression from among five choices. Reading Comprehension items require the student to demonstrate his or her ability to understand and interpret prose passages comparable to those read at college level.

Most English departments in the UW system plan to use this test for incoming freshmen, some of them in conjunction with a writing sample. In 1976 applicants to most UW campuses will be asked to take the test at convenient testing sites as a prerequisite to registration. Future sites are to be established at or near most UW campuses not now offering this service.

After the test has been scored and a writing sample for each student has been evaluated, English departments on most campuses will require that students below minimum standards make use of writing laboratories, special preparatory classes or tutorial help. Students who have demonstrated extraordinary command of English composition skills may be exempted from beginning composition classes and advance to more challenging courses.

To discuss the program in detail and to secure a copy of the test instructions plus sample items, contact Professor William Lenehan, Director, Introductory Courses Division, Department of English, University of Wisconsin, 6195 Helen C. White Hall, Madison, Wisconsin 53706.

LAW

Network Development for Computer-Based Exercises in Legal Education

Work has continued in the development of computer-based exercises to supplement classroom and textbook instruction for law students at the University of Minnesota. The initial development of an exercise in basic evidence for the first-year Civil Procedure course was reported here in Spring, 1974 (Report No. 10). Since then, Roger Park has written three additional exercises for use in the Civil Procedure course. The Civil Procedure exercises deal with pleading, jurisdiction and case analysis. He has also written two exercises for use in Professional Responsibility courses and two exercises for use in Evidence courses. Robert Keeton of Harvard Law School has developed exercises in torts law (intent and child injury) and in trial practice on the University of Minnesota computer system.

During 1974-75 and 1975-76 these exercises have been made available to and used by law schools at Harvard, Yale, Temple, and University of Southern California. Students and professors have had favorable reactions to the use of these exercises in their courses. Each of the exercises has been rated by more than 90% of the students in each of the law schools as an effective learning experience.

These exercises and others under development in legal education were selected as the first discipline-oriented network use project to be carried out under the auspices of the EDUCOM Planning Council. A workshop for law professors interested in using the computer-aided exercises in their courses during 1976-77 was held in March, 1976. Professors representing 39 law schools worked through the exercises and considered issues of instructional design involved in using the exercises within their courses. On the basis of requests made at the conclusion of the workshop more than 16,000 hours of computer-based instructional time will be provided to 32,000 law students (working in pairs) through the network during 1976-77.

For additional information contact: Roger Park (concerning content of the exercises), Law School, University of Minnesota; or Russell Burris (computer-based instruction and networking), Consulting Group on Instructional Design, University of Minnesota, Minneapolis, Minnesota 55455.

MATHEMATICS

A Remedial Tutorial Program in Mathematics for Elementary Teachers

The mathematics requirement for elementary teacher candidates at The University of Michigan has for many years consisted of a single course, dealing primarily with the structure of number systems. It is built around the assumption that students will have had good backgrounds in school mathematics. Most have had three or four years of high school mathematics and some one or more semesters of calculus. In addition to this content course, perhaps 80% of these students take arithmetic methods in the School of Education.

During recent years, an increasing number of students have demonstrated their inability to profit from the course, and an experimental remedial course was begun in the fall of 1974. A test of basic arithmetic and geometry was given to 120 students. Scores ranged from 35 to three, with a median score of 24. Fifteen students with scores below twelve were selected for the remedial section, and students who wrote almost perfect papers on the test were invited to serve as tutors.

Special materials were prepared, consisting of worksheets on computation, the solution of written problems, and a bit of geometry. Students and tutors work together about four hours per week in an informal classroom setting; only a few very brief lectures are given. The primary purpose is to develop basic understandings, since the students share an inability to form mental images of numerical concepts. At the end of the course students are carefully tested over a three day period. Most of them spend about six hours working on the final examination. The intent is to test comprehensively and place no one under time pressure.

By now approximately 65 students and twenty tutors have been involved in the program, and reaction has been favorable. Approximately 80% of the students pass, 10% fail and 10% drop out.

In the fall of 1976 this program will be modified. Until now it has served as a replacement for the required mathematics course mentioned above. From now on students who complete the tutorial program successfully will be be required to take the standard course also. Hence, these students will have a two-course mathematics requirement.

For further information contact Professor Charles Brumfiel, Department of Mathematics, The University of Michigan, Ann Arbor, Michigan 48109.

MEDICINE

An Independent Study Learning Option in the Basic Medical Sciences

Three years ago the University of Wisconsin-Madison Medical School began the development and implementation of an independent study learning option in the basic medical sciences for a selected number of students. The program is intended to: a) better provide for students with a greater variety of educational backgrounds entering medical school, b) allow individual progress in achievement of educational goals, c) permit precise measurement of the attainment of these goals, and d) inculcate habits of independent study that will become lifelong.

The Independent Study Program (I.S.P.) was implemented in the years 1973-76 for 30 students who indicated a preference for that mode of instruction. Out of 159 students admitted each year, an average of 44 have requested the I.S.P.

The I.S.P. courses were developed to replicate the regular curriculum content. The format is characterized by 1) explicitly stated learning objectives, 2) learning options for student achievement of objectives (i.e., printed faculty handouts, text references, slide/tape programs, and video tapes), 3) frequent opportunities for student self-assessment, and 4) criterion-referenced certifying examinations. I.S.P. students make use of a special testing center to take self-assessment exams with immediate feedback and to take course certifying examinations when they feel prepared to do so. Students attend very few required learning activities, but interact with faculty on an individual basis when learning problems occur.

After three years of experience the program has demonstrated, for example, that: 1) students opting for the I.S.P. do not differ significantly from other students in terms of MCAT scores, undergraduate GPA's, sex, age, or academic degree background; and 2) students in the I.S.P. are able to achieve the basic science requirements at achievement levels equal to or higher than students in the regular curriculum.

I.S.P. courses can be kept updated with approximately the same faculty time investment as regular curriculum courses, and a variety of alternate learning experiences can be identified and/or developed for students in specific programs of instruction.

For printed materials on the I.S.P. including faculty and student guides and a description of data gathering instruments, or for a slide/tape introduction, contact Dr. Thomas C. Meyer, Associate Dean and Director I.S.P., School of Medicine, University of Wisconsin-Madison or Howard Stone, Ph.D., Assistant Vice-Chancellor for Educational Resources, Center for Health Sciences, University of Wisconsin-Madison, Madison, Wisconsin 53706.

Instructional Effectiveness of Simulation Technology in Medical Education

This study was designed to determine whether the cardiac examination skills acquired by sophomore medical students using an instructional electronic heart sound simulator were transferable to real patient examination. Attention was also given to the perception of patients regarding the performance of students trained on a simulator as compared to the conventionally trained students. The heart sound simulator was selected because of its extensive use in recognizing heart sounds at the University of Illinois and other institutions.

The sophomore medical class assigned to the Rockford School of Medicine, College of Medicine, University of Illinois, was randomly divided into two groups - experimental group A (simulator) and control group B (non-simulator). Group A received instruction on objectives related to the recognition of normal vs. abnormal heart sounds only from an instructional heart sound simulator. They did not attend classroom lecture demonstration and were not allowed to practice listening to heart sounds of patients in the clinic.

Group B met the same objectives exclusively through the regular classroom instruction and clinical practice on human subjects. Two types of evaluation were used to assess student performance: 1) recognition of recorded heart sounds on the simulator (tape test), and 2) determination of actual heart sounds from six human subjects (patient examination test). The patients were also asked to rate each student's manner on a four item rating scale.

The performance of group A (simulator) on the tape recorded test was significantly higher than that of group B (non-simulator) and they performed equally well when compared to group B on patient examination scores. Thus, skills learned on the heart sound simulator could be effectively applied in examining human subjects. Patient ratings indicated similar perceptions concerning competence and confidence for the simulator and non-simulator groups.

For further information, contact Dr. A. Sajid, Center for Educational Development at the University of Illinois Medical Center, or Dr. Michael Feinzimer, M.D., Rockford School of Medicine, Urbana-Champaign, Illinois 61801.

A Personalized System of Instruction in Medical School Biochemistry

The Keller Plan has proved an adaptable alternative in medical basic sciences at The Ohio State University College of Medicine for the past three years. Based on the results of a 1973 pilot program, all entering medical students selecting the lecture-discussion track now meet their basic science biochemistry requirement via a self-paced, mastery-oriented method of instruction.

Fundamental to the program is tutor-approved written and oral performance demonstrated by each student as he or she moves through the locally prepared instructional units. Each unit specifies what the student is required to know and where he or she can find the material in the two required texts. Also a part of each unit are multiple-choice and short answer questions and answers which may be used in preparing for the short answer written and oral tutor-administered quiz.

Findings to date have indicated that the method: 1) has increased student learning, as indicated by National Board Examination performance; 2) offers students flexibility in meeting other required course demands; 3) provides a mechanism for self-instruction which can be applied throughout a career; 4) allows for the effective utilization of tenured faculty members with either an inadequate lecture ability or a preference *for* tutorial *teaching*; 5) *justifies* the support *of* graduate student teaching assistants in departments where laboratories are no longer a part of the medical curriculum; 6) allows students to obtain practice in oral communication, a critical component of clinical medicine; 7) allows students with previous training to concentrate on areas of deficiency or to become involved in additional learning activities (i.e., individual research); 8) has demonstrated that peer tutors (students entering with a strong biochemistry background), upper level medical students and doctoral students can gain educational benefits from the tutoring experience; 9) provides materials helpful to students throughout the medical curriculum for a variety of remedial or review purposes; and 10) has been received extremely well by faculty and students alike.

For research publications, sample units, or further information, contact Dr. Frank T. Schimpfhauser, Asst. Director, Division of Research and Evaluation in Medical Education, The Ohio State University, College of Medicine, or Dr. Keith Richardson, Professor, Department of Physiological Chemistry, The Ohio State University, College of Medicine, Columbus, Ohio 43210.

Evaluation Model for an Integrated Premedical-Medical Program

Report No. 8, Spring 1972, announced the start of the University of Michigan's Inteflex program, which allows students to pursue both a liberal education and a medical degree within a six-year curriculum. Students in the program's first class are now completing their fourth year of study; from the beginning of their admission procedures, a team of evaluators has closely followed their progress. During this period, data has been collected on the processes of student development, the socialization of professional role, and the evaluation of the program's courses, modes of instruction, residential arrangements, and achievement of goals.

Curriculum development receives particular attention, since 65% of the courses are newly created as offerings in the College of Literature, Science, and the Arts or the Medical School. Each area of the curriculum (clinical studies, basic bio-medical science, social sciences, humanities, and field preceptorships) requires special evaluation procedures and measurements against standard criteria. Courses range from introductory Chemistry to Philosophical Ethical Analysis and an Introduction to Patient Care preceptorship with a practising physician in Michigan.

The longitudinal and cross-sectional study has functioned as follows: All students invited for an interview by the Admissions Committee are administered a battery of demographic, attitudinal, ideologic, evaluation and personality measures which combine with academic record, interview, and recommendations as admissions data. Control groups of students are those who interviewed for the program but enrolled in LS&A, as well as students in the four-year liberal arts Residential College who expressed no interest in Inteflex. Each class is retested following the Patient Care preceptorship in late June of the first year; every two years, individual interviews assess experiences, satisfactions, and self-perceived change. Faculty and student course evaluations and normative data such as Medical College Admission Test and Medical Board Exam scores are other evaluative measures employed. Periodically, new instruments are designed to tap emerging concerns as students move into the clinical and professional parts of the program. Follow-up evaluations will extend into the internship and residency periods.

The study serves to relate the entering student's background and attitudinal characteristics to his or her achievement within the Inteflex program and in future practice. The evaluation model is designed to focus not only on the outcomes of interest - academic achievement, clinical competence, performance in practice - but also on the experiences which had an impact on those outcomes.

For further information contact Donald R. Brown, Center for Research on Learning and Teaching, The University of Michigan, 109 E. Madison Street, Ann Arbor, Michigan 48109.

NATURAL RESOURCES

Development of a Modularized Core Program in Human Ecology

All majors in the College of Human Ecology are required to take several courses comprising a "core" curriculum. However, the curriculum was found to lack variety, flexibility, and individualized learning experiences for students as well as satisfactory opportunities for faculty involvement. The faculty initiated an Educational Development Program (EDP) project for program development designed to 1) accomodate the varying abilities, interests, and motivation of all students; 2) be progressive in levels of comprehension and evaluation; 3) be competency or mastery based; and 4) be current with day-by-day as well as long term world events and issues.

After considerable discussion and analysis, it was agreed that the core courses would be "exploded" into nine one-credit units or modules of instruction with the following characteristics: 1) flexible sequence; 2) variety in teaching methods; 3) accommodation of diverse interests and abilities; and 4) provision for entry and withdrawal when competencies were demonstrated.

A project task force began by clarifying the content of the curriculum, identifying topics to be covered in each of the nine modules, and determining the sequence of topics within modules. A management system for advising and evaluating the students' progress in the program was also produced. Two-thirds of the modules have been completed and the total package should be finished by the end of the 1976 academic year.

Evaluation of the six modules already available shows that students who use them achieve at a somewhat higher level and are less dependent on their instructors. This is particularly true of students who have had some preparation or experience in the module content areas. The reaction of faculty has also been favorable; they report that the use of individualized instruction has expanded their role to more of a facilitator than simply a purveyor of information.

The major problems encountered in the project have been the faculty's shortage of time for developmental work and their inexperience in program development. The systematic design and development of instruction is a new process for many faculty members, but with the instruction and guidance of consultants from the Instructional Development and Telecommunication Services (ID&TS), the team members were able to master the skills required.

For more information, contact Mrs. Jean Page, College of Human Ecology, Michigan State University, East Lansing, Michigan 48824.

PHYSICAL EDUCATION

The Use of Media in Ballroom Dance Classes

Ballroom dancing is one of the most popular elective activities offered by the University of Illinois, Urbana-Champaign, Department of Physical Education. In 1970 only a beginner's level course was available, but intermediate and advanced instruction were added in the two following years. By the fall semester of 1975, 1770 students preregistered for the 480 available spaces.

To alleviate this problem, the Office of Instructional Resources assisted the department in the production of films as a supplementary teaching tool. The Belser "Cue-See" machine was employed, which uses a super 8mm film cartridge which can be projected onto an attached 6" x 8" screen for individual or small group viewing or onto a wall screen for larger groups. A built-in cassette contains sync pulses to advance and stop the film as programmed.

The use of the story board technique facilitated the planning, outline, discussion, and final strategy of film production. Eight color modules were completed, each with narration and music. They progress from a historical overview to instructional units on leading and following, waltz, fox trot, and other specific dance steps. Each module includes a descriptive introduction and close-up shots of each partner's footwork, as well as a demonstration of the couple dancing together.

Two sections were involved in testing the effectiveness of the medium as a supplementary tool. Section A was a self-paced group which used the modules exclusively, receiving no teacher instruction or scheduled peer group interaction. Section B had divided class periods, with 15 minutes spent with the teacher, and 15 each with the modules and the peer group. Both sections were evaluated after a three week period, and the entire procedure was reversed. A final evaluation took place after three more weeks.

Students in both sections remained fairly consistent in their attitudes. The "media as a valuable part of the student's learning experience" was ranked higher by those currently using media alone than by those with the teacher and media combination. While students can acquire ballroom dancing skills equally well from either method, the media/instructor option is strongly preferred. The technique frees the teacher from routine skills instruction, providing more time for individualized and remedial help. The media modules can also serve as review material, as a tool for analyzing intricate step patterns, and as a means of evaluating skill performance.

For further information, contact Aurora S. Villacorta, Department of Physical Education, University of Illinois, Urbana-Champaign, Illinois 61801.

PHYSICS

A Slow-Paced Physics Course Sequence

A slow-paced physics course sequence--covering in three quarters what the regular sequence covers in two--has helped some University of Minnesota students to overcome an inadequate physics background. Most students in engineering and related fields at the University take the regular sequence: Physics 1-271, 1-281, and 1-291. Students with inadequate preparation often find it difficult to keep up, and various approaches have been used to try to help them.

The experimental sequence was designed to cover the same material as Physics 1-271 and 1-281 but at a slower pace. The experimental sequence was timed so students completing the sequence could then enter the final course of the regular sequence, Physics 1-291.

Midway through the quarter preceding the first experimental course, students doing less than C level work in Physics 1-271 and a calculus course were invited to discuss with their advisors and with the course instructor the possibility of taking the experimental course. Only those judged really in need of the course were allowed to enroll.

Demonstrations were used extensively in the course, which met five times each week. Weekly homework assignments were graded and returned to students, then discussed in class. Homework grades did not contribute appreciably to final course grades but completion of assignments was required. Individual help was given outside class whenever a student encountered special difficulty.

With class sizes of ten to thirty students instead of the more usual 100 to 300, the experimental sequence proved a relatively costly effort and has not been repeated. According to Benjamin Bayman, who developed and taught the course, many students would profit from the slower-paced version but a workable mechanism has not been found for identifying and recruiting them early enough.

For further information, contact Benjamin F. Bayman, Professor of Physics, 148 Physics Building, University of Minnesota, Minneapolis, Minnesota 55455.

POLITICAL SCIENCE

Simulation Game on the Arab-Israeli Conflict

For 100 University of Michigan students in Political Science 353, a weekend game on the Arab-Israeli conflict even took precedence over football-watching. As part of a course taught by Clement M. Henry and Edgar Taylor, the students participated in a simulation for predicting future consequences of the Middle East situation. This approach aims to develop a sympathetic understanding of alien political cultures among students in a large lecture course; the experiential dimension was selected as the most effective means for overcoming traditional western orientations.

After ten weeks of preparation through lectures, section meetings, and papers, the students had developed background information for their chosen roles. Eight teams representing the principal local, regional, and international protagonists were formed, and portfolios were drawn up detailing social, economic, political, and military data for these countries.

The class was split in half, each section meeting for intensive 16-hour sessions over a weekend. Each "country" was situated in a separate classroom; messages were filtered through the administrative center, "Control." International face-to-face conferences were arranged, and world press reporters synthesized developments in newscasts every two hours. The Center for Research *on Learning* and Teaching, which had contributed to the developmental phase of the project, joined with the U-M Broadcasting Service in providing equipment and personnel to record the entire proceedings on videotape. International intrigue had a role in the eventual outcome of the simulation: the wife of one of the Palestinian representatives used her strategic position as a volunteer assistant to spy for her husband's team, and was instrumental in the plot which led to "Arafat's" downfall.

The instructors report an unprecedented level of student involvement and interpersonal contact. Papers and readings are prepared with an eye to their immediate practical value in game strategy. As indicated by attitudinal questionnaires filled out at the beginning and end of the course, students gained valuable insights into the complexities of the Arab-Israeli conflict. Through their first-hand involvement, they took home a vivid lesson in political processes as well.

For more information on the game design and evaluation, contact Leonard Suransky, School of Education, 4002 SEB, University of Michigan. For details about the course structure, contact Clement M. Henry, Department of Political Science, 6615 Haven Hall, University of Michigan, Ann Arbor, Michigan 48109.

PSYCHOLOGY

A Minicourse Program in Educational Psychology

Introductory Educational Psychology courses at Northwestern University are being taught using minicourses developed by advanced graduate students who are enrolled in a Seminar on College Teaching. The innovations are directed by a faculty member in educational psychology who teaches the seminar. As a major project, each education psychology graduate student develops a unit of instruction with carefully stated objectives, instructional procedures, and evaluation instruments and then teaches this unit as a section of the larger undergraduate educational psychology course.

The minicourse program requires a large amount of staff time: one professor, one course assistant, and the minicourse instructors participate. Even though a large number of students and staff are involved, the approach proves financially economical because minicourse leaders volunteer their time. The system is an effective way of providing an instructional option and small group experiences to undergraduates enrolled in a large course. It is also a satisfactory vehicle for providing an introductory supervised college teaching experience for graduate students.

Evaluations based upon the introduction of the minicourse approach showed that undergraduates rated them highly and that graduate students were enthusiastic about their systematic, supervised introduction to college teaching. Subsequent evaluations support these initial ratings. The use of the minicourse in this context gives the graduate student a well focused opportunity for planning and development within a manageable frame of reference for a first experience, and it provides undergraduates with some flexibility and choice of topics to pursue in-depth through small group interactions.

For additional information contact Professor Robert J. Menges, The Center for the Teaching Professions, 2003 Sheridan Road, Northwestern University, Evanston, Illinois 60201.

Learning/Grading Options in Abnormal Psychology

Several options are offered to students in the large lecture Abnormal Psychology course at Indiana University. They may earn a "C" by demonstrating proficiency on multiple choice exams on programmed materials covering basic knowledge. Areas include: 1) describing people, psychological measurement, labels of deviance, social ecology of behavior settings and the career of the mental patient; 2) classification of disorders; 3) history of deviance, its conceptualization and treatment; 4) psychotherapy systems; and 5) the spirit of research in psychopathology using two specific cases of research lines, depression and schizophrenia.

To earn a "B" students must write three papers analyzing a screenplay called "Otto: A Study in Abnormal Psychology" from three different perspectives -- psychoanalytic, social, and behavioral. Lectures, discussions and readings are geared to help students think within each perspective, following R. Prince's Abnormal Psychology text. One graduate assistant and two undergraduate teaching assistants hold office hours to help students write the papers, and these may be rewritten an unlimited number of times until a deadline date. The cognitive objective here is development of critical thinking.

To earn an "A" students must demonstrate creative thinking by selecting one therapy (from behavioral, psychoanalytic, gestalt, or client-centered) and writing a screenplay between a therapist and Otto which demonstrates their knowledge of the therapy, its goals and theoretical underpinnings. To facilitate the use of the Otto materials, a screenplay was created at Indiana University for a 30-minute 16mm color film of Otto. Four other films were then made which interpret Otto from four psychological perspectives--Behavioral, Social, Psychoanalytic, and Phenomenological.

Another aspect of the course is a series of feature films with a psychological focus which are discussed in class. The course generates a high level of excitement and interest in those students who work for the B or A. About 30-40 percent decide to earn only a C; since class attendance is not required for that grade, a fairly well-motivated group attends class regularly.

Other approaches to large group instruction have been piloted in this class with some success: buzz-group exercises with the raw data of research (for example genuine and simulated suicide notes), and an advanced, highly-structured undergraduate-led discussion section which focuses on a list of specific topics (e.g., homosexuality, women and madness, sexual deviance).

The five Otto films are available through the Indiana University Audio-Visual Center. For further information contact John Gottman, Department of Psychology, Indiana University, Bloomington, Indiana 47401.

STATISTICS

PSI: An Optional Mode of Instruction in a Statistics Course

Students in Statistics 213 at Indiana University may elect to follow a self-paced instructional format developed as a modified Keller personalized system of instruction. This introductory course teaches basic probability and statistical reasoning with emphasis on mathematical models and problem formulation; a major objective is to prepare students for later quantitative studies. Among the 500 students taking the course each semester there is a variety of mathematical preparation and ability.

The instructor has divided the course material into 15 coherent units; a study guide relates each unit to the textbook for additional background information when needed, provides reading and problem assignments from the textbook, delineates unit objectives, and offers solutions to selected textbook problems as well as a sample quiz. Students study independently but have available a cadre of undergraduate "tutors" who staff a resource room throughout each day. Students demonstrate mastery of each unit through a tutor-administered quiz which is graded in tutorial fashion with student and tutor discussing any errors. Three examinations serve as review units. A series of computer simulation projects are used to add empirical credence to abstract concepts and audio tapes, prepared by the instructor, guide students in their analysis. Quizzes, examinations and simulation projects each contribute points to a cumulative score for grading purposes.

Both quizzes and examinations may be repeated to improve mastery certification, and alternate forms of all test materials protect the integrity of the testing process. A minimal rate of student progress is assured by deadlines set for the completion of each of the three examinations.

Student attitude toward the course is positive. Since students personally select this mode of instruction, it is difficult to make comparisons with the course taught traditionally in small sections. However, students of widely differing abilities have been equally successful in meeting course objectives, and students consistently request that subsequent courses be offered in the same format.

Additional information, sample materials and results of a planned study of student success in subsequent courses may be obtained by writing to Professor James Yackel, Department of Statistics, Purdue University, West Lafayette, Indiana 47907.

ZOOLOGY

Use of Microfiche in the Invertebrate Zoology Laboratory

Confronted with the problem of steadily increasing enrollments in the Fundamentals of Invertebrate Zoology course at Michigan State University, the department obtained Educational Development Program (EDP) support to develop a series of self-instructional audio visual modules for teaching the laboratory portion. AV modules and a student workbook were produced for each unit. Twenty-four carrels, each equipped with a Carousel slide projector and an audio tape player, were installed in the Natural Science Building for easy access by students.

After five years of use, the need to revise and update the modules became evident. In addition, considerable difficulty had been experienced in maintenance and operation of the projectors. Consequently, a second EDP grant was approved to revise the materials into a microfiche format and equip the carrel facility with microfiche readers. The visuals, audio tapes, and student workbooks were completely revised. Three microfiche transparencies containing all of the visuals for the entire course are available at the MSU Bookstore for $.85 each.

The instructional strategy for Zoology 381 includes three lectures a week and two hours for individual study of the module materials (visuals, tapes, and workbook) in the microfiche format.

Evaluation of this new system has indicated that students are able to achieve a greater number of higher level objectives than previously. In addition, the informal comments of students are favorable; they seem to be receiving considerable satisfaction from their achievements in this course.

While the new microfiche system has shown some disadvantages (e.g., the long lead time required by the Eastman Kodak Company for producing the microfiche transparencies) and some constraints on the format or composition of visuals, the advantages of the new system greatly outweigh the disadvantages. Specifically, the advantages are: 1) cost of producing microfiche transparencies is approximately one-tenth the cost of producing the equivalent number of slide sets; 2) cost of revising the materials is greatly reduced; 3) noise and heat problems from projectors in the carrels are eliminated; and 4) maintenance of the microfiche readers is far less than for Carousel projectors.

For further information, contact Dr. Ralph Pax, Department of Zoology, Michigan State University, East Lansing, Michigan 48824.

II. Institutional Support

Computer-Managed Interactive Television in Undergraduate and Life-Long Education

The state of the art in cable TV and computer-managed instruction now allows applications in instructional programs for large audiences both on and off campus. Support was obtained from Venture Funds and the Educational Development Program (EDP) for equipment and personnel to develop the necessary materials, computer programs, and administrative features to offer an undergraduate course using cable TV as a delivery system, touch-tone telephones for examinations, and MSU talking computers to manage the instructional sequence and scheduling.

The course selected for this experiment was Education 410, "Instructional Design and Technology," taught by Stephen L. Yelon. A team composed of faculty, instructional designers, and TV production specialists developed ten prototype programs to be pilot tested in the MSU off-campus married housing. A team of computer specialists developed the necessary programs for the administration and scoring of evaluation instruments, recording grades and student progress, and accounting costs. An extensive set of student workbooks and other instructional materials was also developed.

The instructional strategy involved a televised lecture-demonstration, readings from assigned texts, interaction with the programmed workbook assignments and problems, computer-managed mastery testing via touch-tone telephones, and computer prescription of remediation activities. Dr. Yelon scheduled an orientation session on campus as well as offering telephone "office hours." For example, during and at the end of a television segment, students work through problems in their workbook. Then they use a touch-tone telephone to query the computer for their unit mastery tests. The test items are displayed on the television, students respond by touch-tone input, and they receive audio feedback. If mastery is achieved, the computer tells the students the channel and time for the next televised program. If more study is needed, the computer sources an alternate test or assigns remedial study. In addition, students are encouraged to call each other for help.

For more information on this project, contact Dr. Erling S. Jorgensen, Instructional Television Services, 116 Linton Hall, Michigan State University, or Dr. Stephen L. Yelon, Assistant Director, Learning and Evaluation Service, 17 Morrill Hall, Michigan State University, East Lansing, Michigan 48824.

FACULTY DEVELOPMENT

Purdue's CAFETERIA Instructional Evaluation System: An Update

An earlier issue of this publication (Report No. 10, Spring 1974) included an initial description of Purdue's diagnostic instructional evaluation system, called CAFETERIA. It is a computer-based system specifically designed to adapt to most instructional styles, course types, and settings and to foster wide faculty participation through individual involvement in the design of tailor-made instructional rating questionnaires. Participants accomplish this by selecting rating scales (items) from a set of about 200 items listed in a prepared "pool" or catalog. Instructors' requests and specific item selections are processed and their questionnaires are prepared automatically by a computer line printer. Student ratings are gathered and analyzed by computer; participants then receive individual, confidential reports which list all the selected items, the distribution of students' responses to each one, the median of each distribution, and its percentile equivalent. Thus, instructional strengths and weaknesses are shown. These reports also summarize the demographic composition of the student group and their responses to several (typically, five) global and mandatory "core" items. The major processes of the CAFETERIA system are controlled by four computer programs, written in FORTRAN and capable of "running" on many mini-computer systems.

Since the earlier report was prepared, several CAFETERIA features have been added and experience has expanded greatly; e.g., item norms have now been accumulated and provide the basis for reporting each item's percentile equivalent. Also, rating questionnaires are now printed directly on the student's response sheet, which then becomes a processed "turnaround" document. (The earlier system employed student response cards with separate questionnaires.) Further, faculty acceptance continues to grow: users number 1750 local classes per semester, plus a similar number of classes on each of more than 20 other in-state campuses. Approximately 25 out-of-state institutions have also adopted CAFETERIA.

Important issues concerning the confidentiality of results, the preservation of instructor latitude in questionnaire design, the expansion of the item catalog's contents, the refinement of item norms, and the use-abuse of results in personnel review situations are under continuing scrutiny. A major research effort has also been launched to draw initially upon the large and accumulating file of data from past uses. Additional studies are being designed to examine questions that require special manipulations of conditions or require supplementary information. By the time this report is published, these studies will be well advanced and in some cases completed.

For further information, contact Dr. Warren F. Seibert, Measurement and Research Center, ENAD 402, Purdue University, West Lafayette, Indiana 47907.

Role Models for Women Science Undergraduates

"Women and the Science Disciplines" was initially implemented as part of a school-wide experimental two-year program to reduce the excessive attrition rate of women science undergraduates by providing a series of viable role models. The course, which is team-taught, uses a seminar format consecutively covering each of the seven discipline areas in the School of Science. Initial weeks are spent in exploring the nature of the relationship between science and society and the historical role and contributions that women have made to the sciences. Then a typical week will include an overview lecture by a faculty member of the discipline under discussion, and a visit from a successful woman practitioner, discussing her professional activities and as much of her personal history and lifestyle as is appropriate. Some class time is also devoted to consideration of employment prospects, the advantages and disadvantages of graduate education, beneficial experiences available to undergraduates (i.e., NSF summer internships, research and teaching assistantships), and the "nuts and bolts" of how these things can be accomplished.

The course is offered in alternate semesters [illegible] is now in its third year. Analyses of attrition data and student evaluations have shown that the course is effective in helping to reduce the attrition rate. General faculty response to the course has been extremely favorable, as demonstrated by the willingness of the faculty to participate as lecturers and resource persons.

As of Spring 1976, "Women and the Science Disciplines" became one of the radio courses offered to the general public through Continuing Education and is thus aired weekly on Purdue's radio station, WBAA.

For further information, contact Lynne Harrington Brown, School of Science, Mathematical Sciences Building, Purdue Univeristy, West Lafayette, Indiana 47907.

MEASUREMENT AND EVALUATION

A Computer Program to Record Test Scores and Evaluate Student Performance in Large Courses

To evaluate student performance and record grades in large or multi-section university courses, instructors and assistants must typically perform enormous amounts of clerical work. Usually all test scores and grades on papers, laboratory performance, and exercises are recorded in grade books, weighted, and combined for a final grade. Partly because of this time-consuming process, it is common to test student achievement only once or twice during the term--hardly enough to provide either a valid assessment or continuous feedback to students.

In an effort to deal with these problems, Dr. Leighton Price of the Computer Institute for Social Science Research (CISSR) has developed a computer program called GRADER. The program enables instructors to eliminate most manual record keeping, substantially reduce the probability of human error, use a wide variety of evaluation procedures, increase the frequency of evaluations, and employ methodologically sound procedures for combining scores from different types of student assessment. This general purpose computer program can work for most departments throughout the University.

The GRADER program has been in experimental operation on the MSU CDC 6500 Computer for several years; to increase faculty awareness of its availability, the Educational Development Program (EDP) supported preparation of workshops to train faculty and graduate assistants in its use. Faculty utilization of the program has increased substantially as a result. Of the MSU faculty now using GRADER, most are responsible for grading and record keeping in courses enrolling more than 100 students, and several teach classes with enrollments over 500 students.

Recently, the responsibility for operating GRADER has come under the Learning and Evaluation Service. A second EDP grant has been approved to develop necessary materials and procedures for an ongoing series of faculty workshops, to provide consultative services for users of GRADER, and to complete program modifications to add several new features and simplify use. The program is presently being adapted for the MSU IBM 360 computer.

For further information, contact Dr. Leroy Olson, Learning and Evaluation Service, 202 S. Kedzie Hall, Michigan State University, East Lansing, Michigan 48824.

EXTRA-DEPARTMENT PROGRAMS FOR THE INDIVIDUAL STUDENT

Cooperative Education Program for Liberal Arts Students

Liberal arts students at the University of Minnesota are now enjoying the same kinds of opportunities to combine school work with on-the-job experience that students in business and technical fields have had for years.

Through the cooperative education program of the Office for Special Learning Opportunities, students alternate quarters of full-time study and full-time work. In addition to the training received on the job, the student is paid for the work and receives academic credit for a special project that usually is completed during the quarter of work.

During 1975-76, the first year of the program, nineteen students were placed with the Twin Cities office of Housing and Urban Development (HUD), the National Aeronautics and Space Administration in Houston, a Twin Cities refinery, and the University's computer center.

The program attempts to place students in jobs closely related to their interests and fields of study. For example, a major in biological science has worked in the laboratory of a refinery, conducting quality-control tests and taking air and water measurements for environmental tests. A student majoring in psychology and sociology has worked with HUD, combining in-office work with field work such as inspection of an apartment house where tenants sought HUD assistance in renovating the structure and operating it as a cooperative venture. Participants see the program as a way to gain "real-life" experience as well as to increase post-graduation job opportunities.

For further information, contact Don Myrvik, Office for Special Learning Opportunities, 201 Wesbrook Hall, University of Minnesota, Minneapolis, Minnesota 55455.

External Degree Program at University of Iowa

The Bachelor of Liberal Studies is designed to be a degree that may be earned in part or totally through part-time study with no residency requirement. It is designed for adults who cannot attend college as full-time on-campus students. Credits may be earned through on-campus classes, off-campus classes, University credit correspondence courses, proficiency examinations or credit courses taught by radio, television, newspaper or other media combination systems.

To be admitted to the program a student must have completed at least 62 semester hour of transferable degree credit. The College of Liberal Arts basic skills and core course requirements must be satisfied unless the student has been awarded the Associate in Arts or Associate in Science degree by an accredited two-year institution.

A total of 124 semester hours is required for the Bachelor of Liberal Studies degree. At least 45 of these hours must be earned in courses which are designated as upper level courses at the University of Iowa. A total of 45 semester hours must be completed in courses offered by one or more of the three Regents Universities in Iowa. If the degree is to be awarded by the University of Iowa, at least 30 of these hours must be in courses offered by the University of Iowa.

The awarding of the degree requires a GPA of at least 2.0 on all work offered for the degree, in all work completed after admission to the program, and in the 45 semester hours of upper level courses. The student may develop an area of emphasis but this is not required.

The BLS degree program is administered through the Extension Division of the University of Iowa. A nine-member advisory committee appointed by the Dean of the Committee of the College of Liberal Arts approves all curriculum and degree requirement decisions.

For further information contact Mildred Lavin, Division of Continuing Education, University of Iowa, Iowa City, Iowa 52242.

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